Figure 13.1   The Life Cycle: System and Human
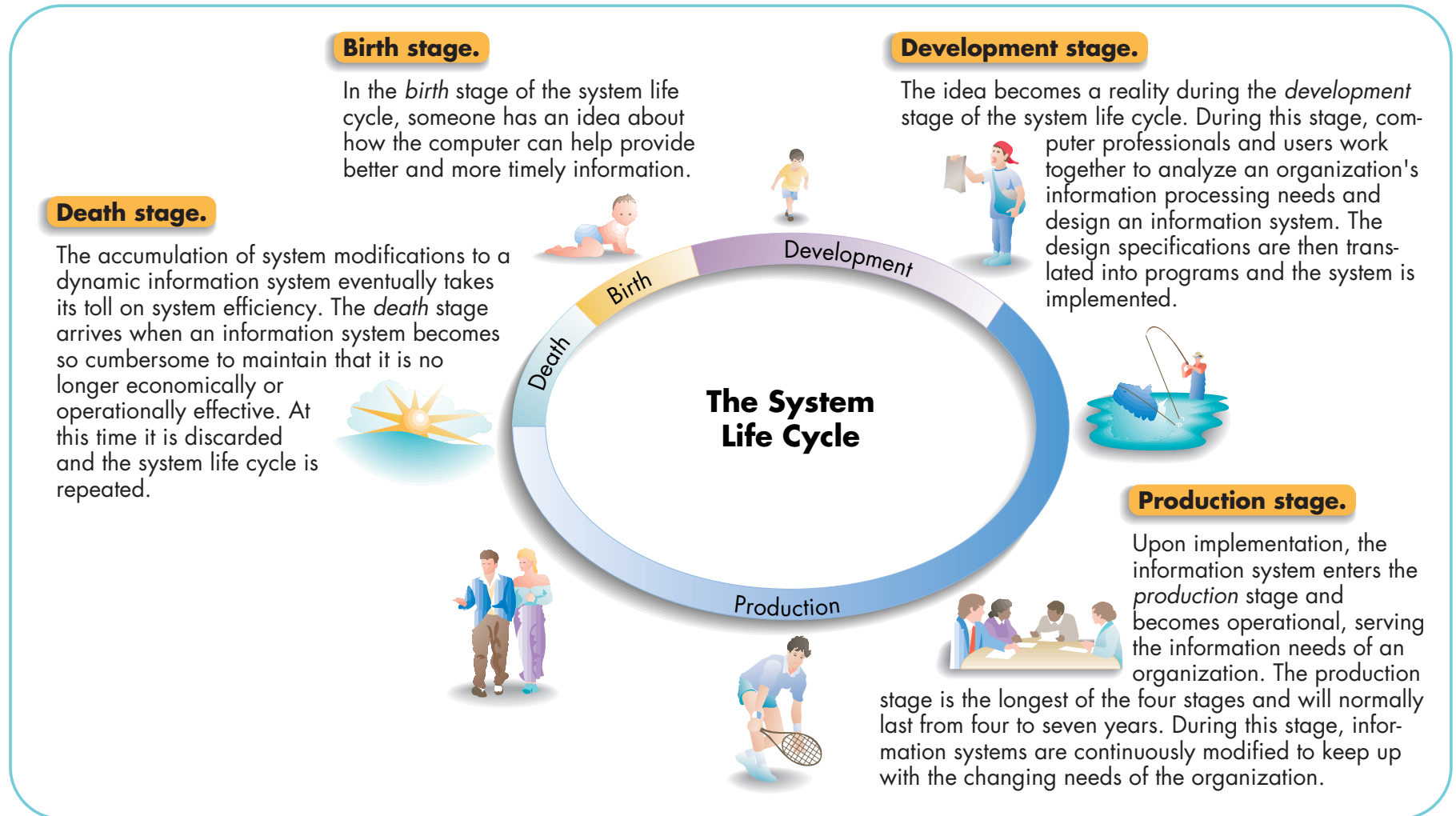
Birth stage.

In the *birth* stage of the system life cycle, someone has an idea about how the computer can help provide better and more timely information.

Development stage.

The idea becomes a reality during the *development* stage of the system life cycle. During this stage, computer professionals and users work together to analyze an organization's information processing needs and design an information system. The design specifications are then translated into programs and the system is implemented.

Death stage.

The accumulation of system modifications to a dynamic information system eventually takes its toll on system efficiency. The *death* stage arrives when an information system becomes so cumbersome to maintain that it is no longer economically or operationally effective. At this time it is discarded and the system life cycle is repeated.

The System Life Cycle

Development

Birth

Death

Production

Production stage.

Upon implementation, the information system enters the *production* stage and becomes operational, serving the information needs of an organization. The production stage is the longest of the four stages and will normally last from four to seven years. During this stage, information systems are continuously modified to keep up with the changing needs of the organization.

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Figure 13.2   Structure Chart

Figure 13.3   Data Flow Diagram Symbols

An entity that
is source or
destination of
data/information
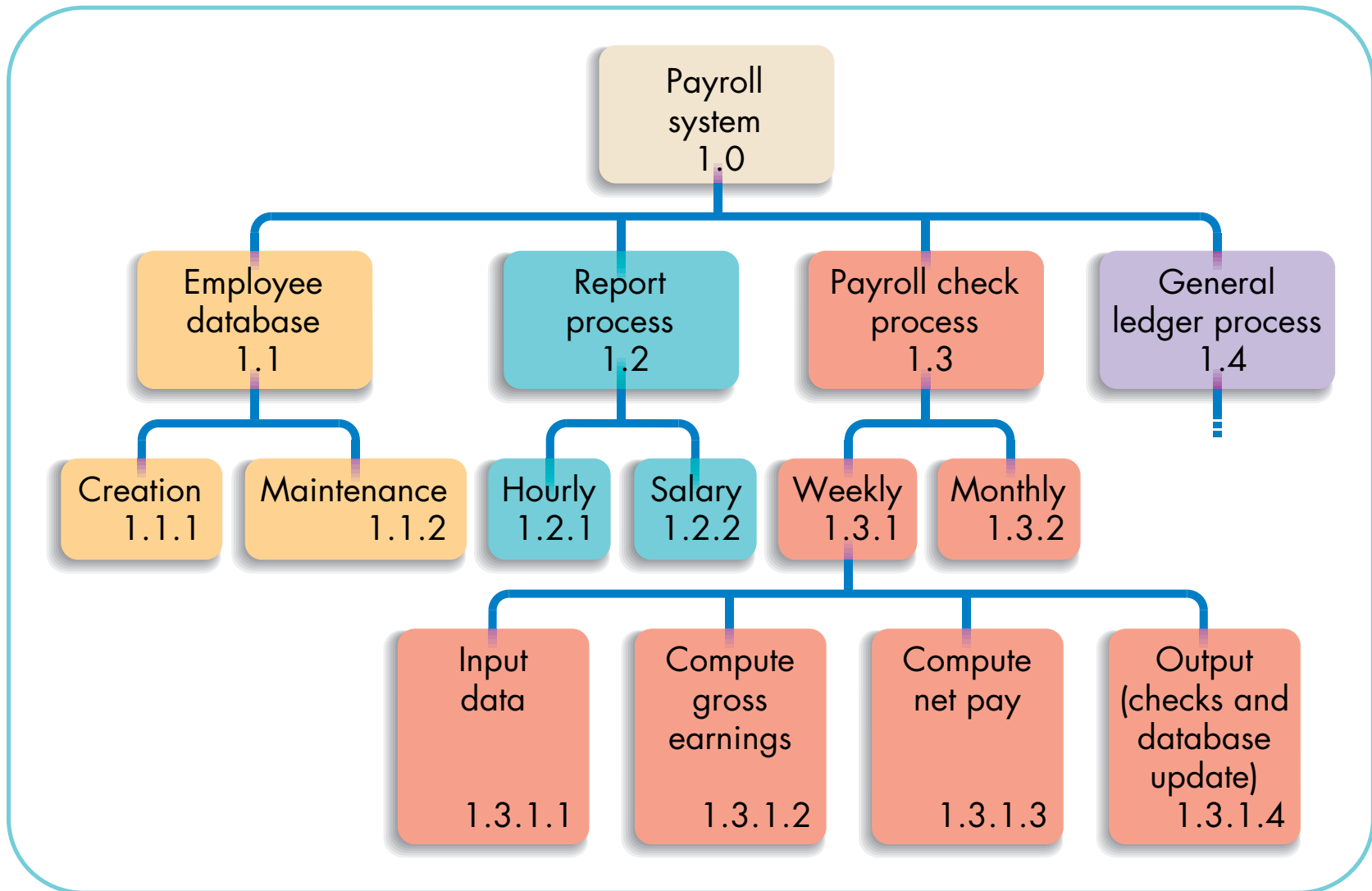
ID

Description

Process

Direction of
flow of data/
information
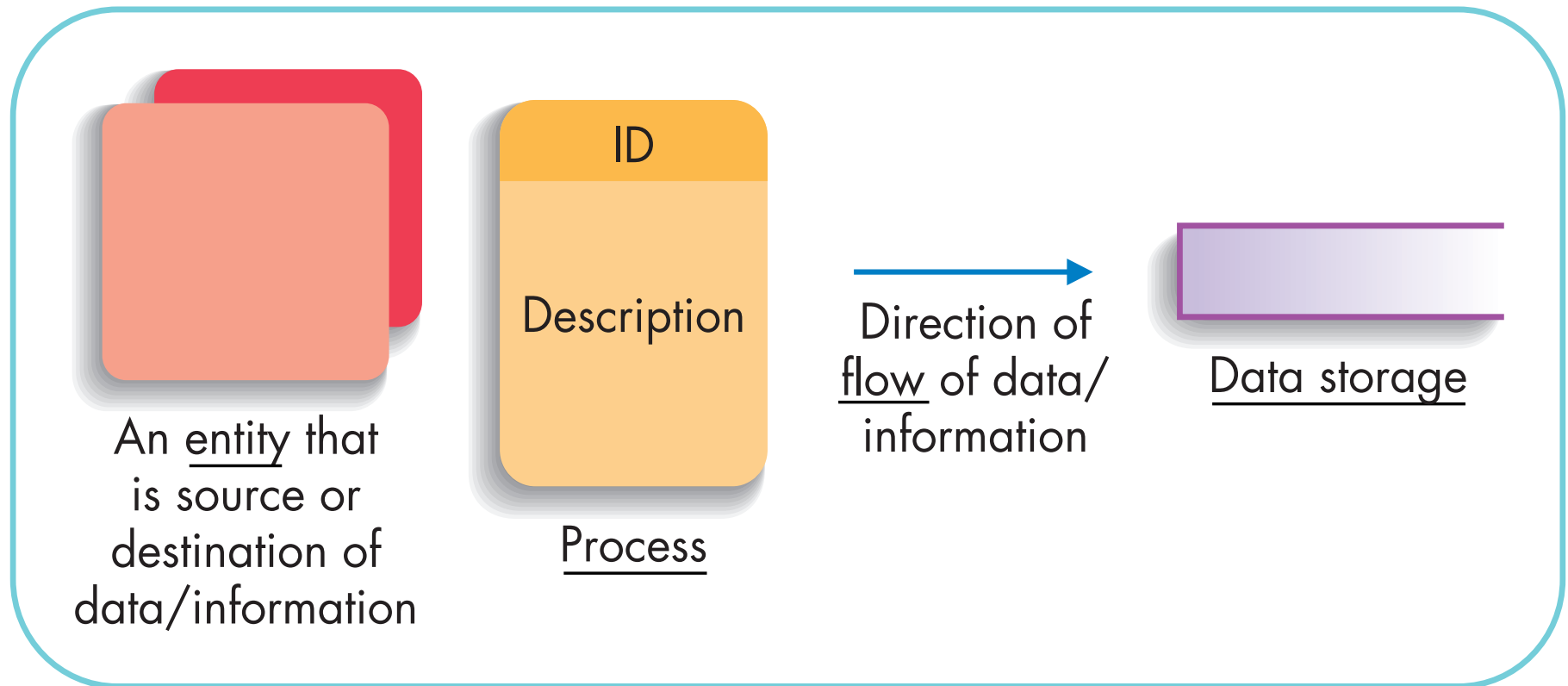
Data storage

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Figure 13.4   MIS Overview for BrassCo Enterprises
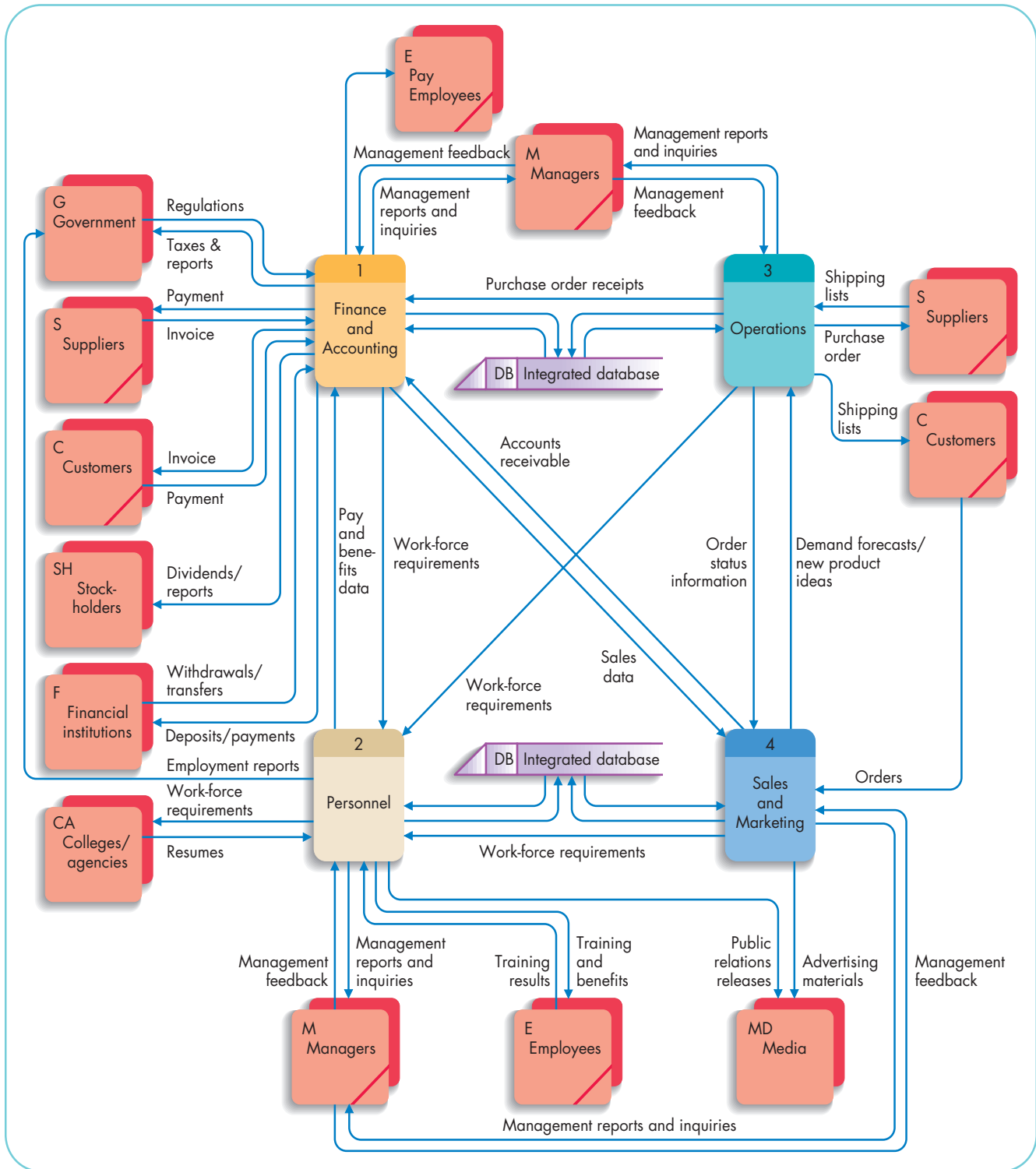
Figure 13.5   BrassCo's Personnel Resource System

Figure 13.6   Flowchart Symbols

Computer Process
Any processing activity

Predefined Process
Refers to a group of operations

Decision
Point of decision

Yes

Terminal Point
Begin or end a procedure

No

Connector

A A

Connects parts of a flowchart without use of flow lines

Annotation
Make notes in flowchart

Flow lines
Lines indicate direction of flow

Online storage
Refers to an online file or a database

Input/output
Any input to or output from the system

Display
A PC or workstation display

Printed output
Any printed document

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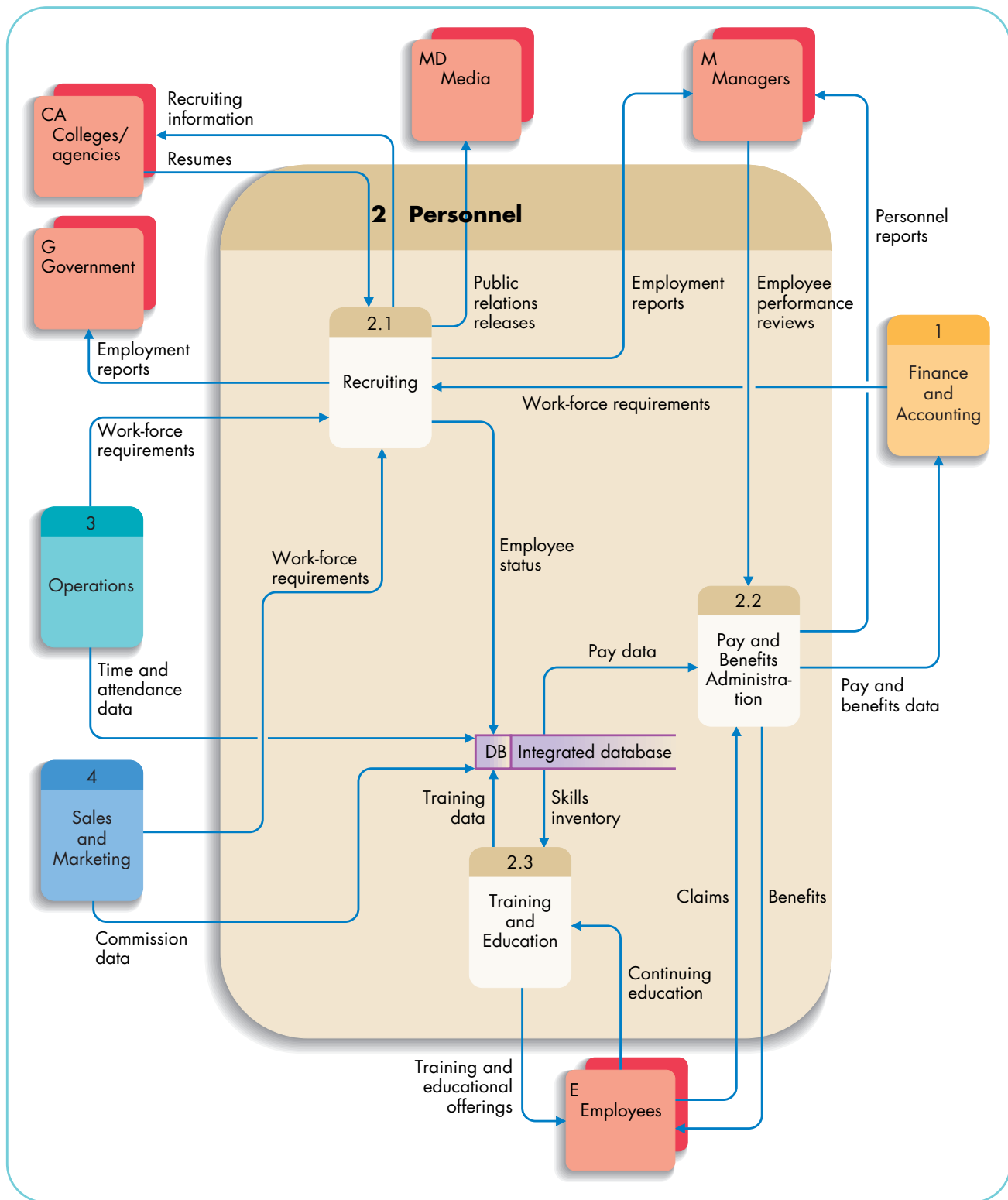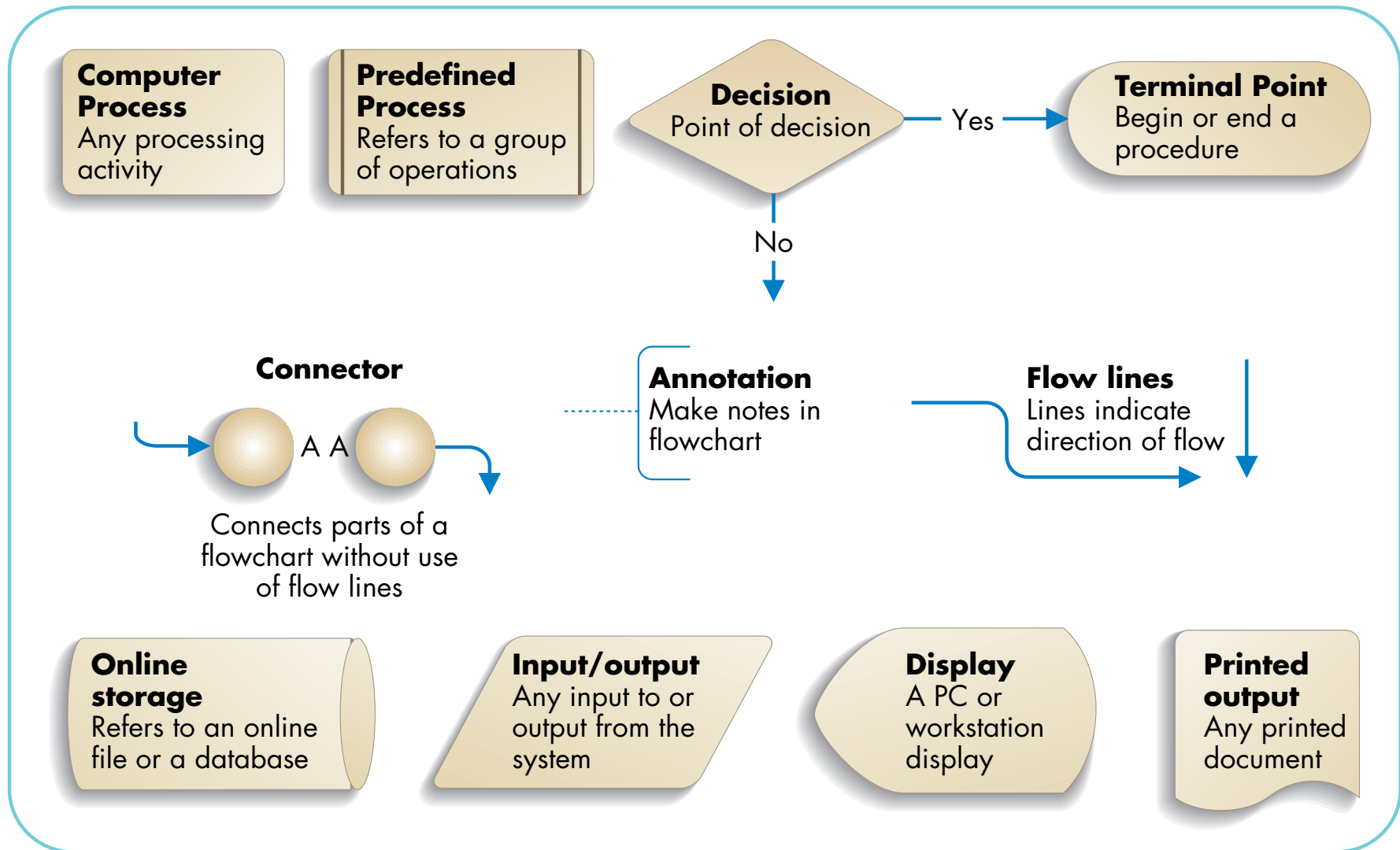
Figure 13.7   Program Flowchart
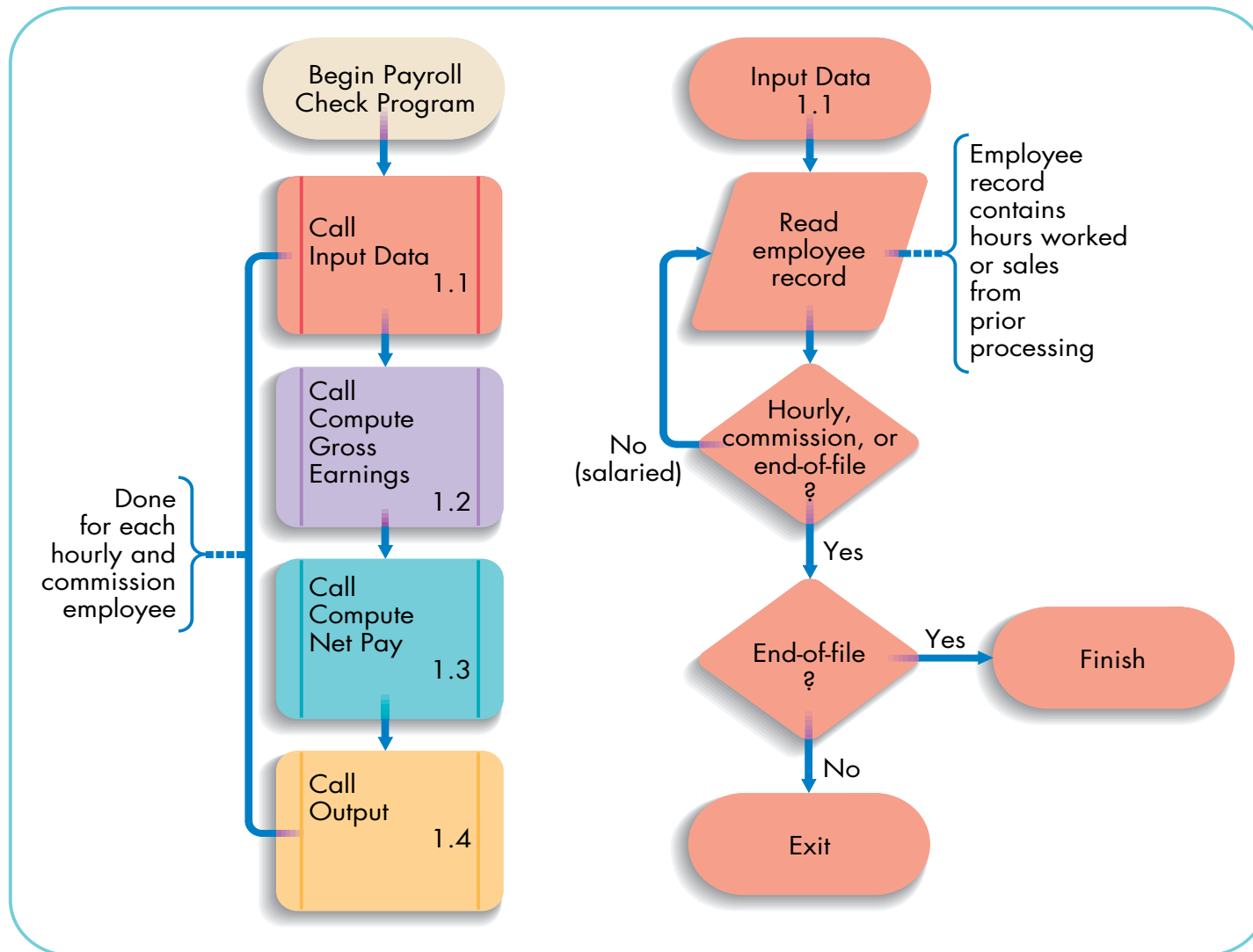
Figure 13.8   The Four Phases of the Prototyping Process

| PHASE I
Define system specifications | → | PHASE II
Create prototype system | → | Use prototype system | ← | Modify prototype system |

PHASE III
Refine prototype system

User OK?

User suggestions

PHASE IV
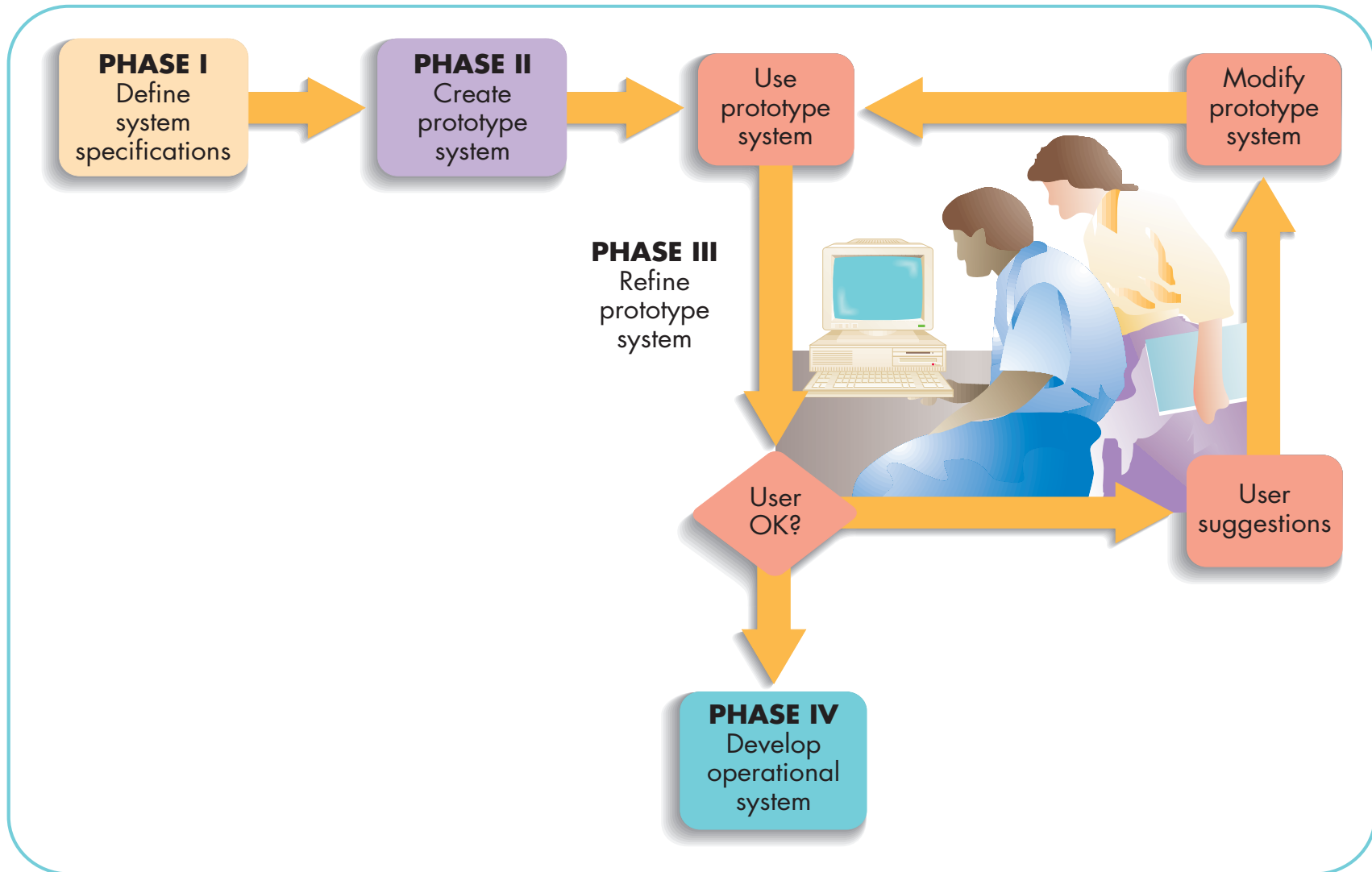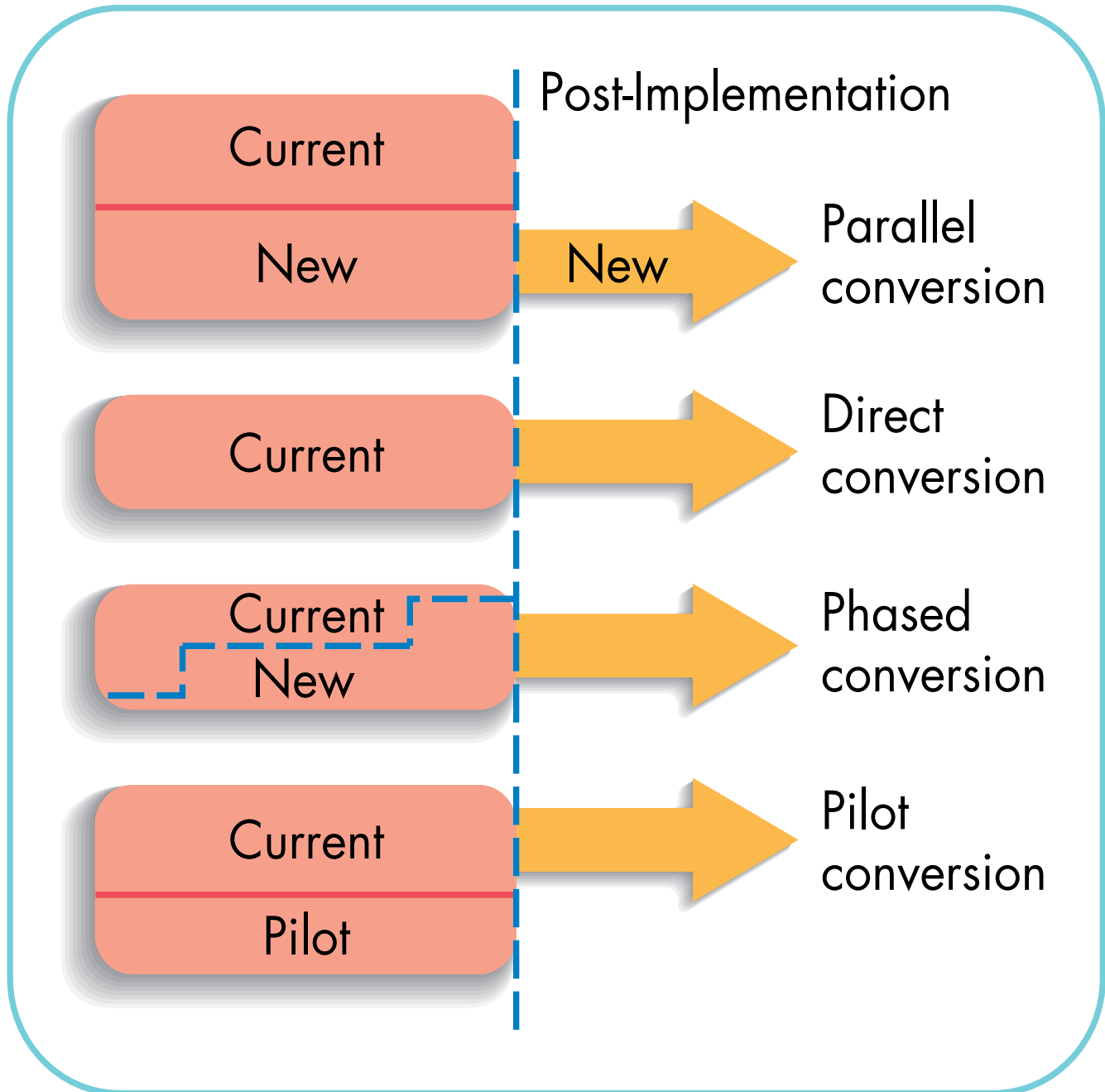Develop operational system

Figure 13.9   Common Approaches to System Conversion

Figure 13.12   Steps in Writing a Program

Document the program.

7. Documentation, which might include a *program description, a structure chart, a flowchart, a program listing,* and an *interactive session* (I/O when the program is run), is critical if the program is ever modified.

Test and debug the program.

6. The program is tested and debugged. Debugging rids the program of bugs, eliminating *syntax errors* (violations of one of the rules for writing instructions) and *logic errors.*

Code the program.

5. Steps 1 through 4 are translated into machine-readable instructions called programs.

Design the detailed logic of the program.

4. The *detailed* design results in a graphic representation of the program logic that includes *all* processing activities and their relationships, calculations, data manipulations, logic operations, and all input/output.

Design the general logic of the program.

3. The *general* design of the program is oriented primarily to the major processing activities and the relationships between these activities. By first completing a general program design, you make it easier to investigate alternative design approaches.

Analyze the problem.

2. Break the problem into its basic components for analysis. A good starting place for most programs is to analyze the *output, input, processing,* and *file-interaction* components.

Describe the problem.

1. Identify exactly what needs to be done. It often helps to describe the problem in words.